Preliminary Results from the TES Retrieval Algorithm Single Orbit Test

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Simulations of the data acquired by TES along an orbit track (73 different target scenes) were generated in order to test the TES nadir and limb retrieval algorithms for different spatial and temporal (seasonal and day/night) regimes. The simulated TES spectra were created using atmospheric profiles sampled from MOZART3 model data. In this run of MOZART3, the model was driven by WACCM meteorological fields. The model data used in this test were for the October 2 day of an arbitrary year.

The TES Level 2 algorithm retrieves vertical profiles of atmospheric temperature and trace gases from radiometrically calibrated measured spectra. This retrieval is based on minimizing the difference between a measured spectrum and a model spectrum, which is calculated for the estimated atmospheric state. This minimization is subject to smoothness constraints imposed on the atmospheric profiles being retrieved and is applied iteratively using a non-linear least squares solver until the solution converges. Retrieval results, including error analysis and expected vertical resolution, are shown for both the nadir and limb viewing modes of TES.

MOZART = Model for OZone And Related Chemical Tracers (Data are courtesy of D. Kinnison, NCAR).
TES = Tropospheric Emission Spectrometer (EOS-Aura platform)
WACCM = Whole Atmosphere Community Climate Model